Date: Wed, 7 Apr 93 19:33:31 PDT
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V93 #432
To: Info-Hams

Info-Hams Digest   Wed, 7 Apr 93   Volume 93 : Issue 432

Today's Topics:
              11m to 10m conversion (or any other bands)
                                  A New DSP
                         ARRL living in the past?
                             Crystal Catalog
                          Install PL in TH21AT ?
            Need serial protocol for Uniden MR8100 scanner
  Repeater coverage on MacKenzie Trail in British Columbia, Canada?
   RFD: rec.radio.amateur reorganization [discussion summary 3/31]
                 Soldering Brass rod to SO-239? HELP?
     tnc or sync modems on Multi-Drop phone lines with ka9q ax25

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Thu, 8 Apr 1993 00:42:40 GMT
From: usc!howland.reston.ans.net!ux1.cso.uiuc.edu!news.cso.uiuc.edu!
uxa.cso.uiuc.edu!jtg0707@network.UCSD.EDU
Subject: 11m to 10m conversion (or any other bands)
To: info-hams@ucsd.edu

How easy/hard is it to convert a cb radio to 10m or any ther amateur bands?
The cb radios I've come across in the local stores seemed very reasonably
priced. Where do find info on that sort of stuff? Anyone out there on the net
has done the conversions before?

Date: Wed, 7 Apr 1993 12:28:34 GMT
From: usc!zaphod.mps.ohio-state.edu!pacific.mps.ohio-state.edu!linac!tellab5!
jwa@network.UCSD.EDU
Subject: A New DSP
To: info-hams@ucsd.edu

In case your interested in DSP's Here is an article that
I worte, that appeared in the January 92 issue of QEX

A NEW DSP FOR PACKET

In the early 70's synthesized radios became available to the Amateur market. However, the technology wasn't new. The Military used synthesized radios since the early 60's. The computer and micro-processor became popular in the mid 70's and that got us into the packet age in the 80's. But we all know that electronic computers where around for about 25 years. In the 90's, it appears that the hottest item is the DSP. Again the technology has been around for about twenty years and it's finally making it's way into the Ham Radio market. As with any new technology the reason for it's availablity is cost reduction due to large scale integration.

Manufactures of Ham gear are including DSP's in their products and there is a little skepticism about the price! Is it really worth the three or four hundred more dollars just to clean up a few harmonics in my signal? How can it improve packet reception on HF? Will I have sell my old gear ? After being involved in a DSP development project I beleive that the DSP can make a significant improvement in HF packet and RTTY reception and it's well worth the investment.

For the about the past 7 years the DSP has been reduced to a single chip about the size of the microprocessor in your computer. In fact, the DSP is nothing more than a microprocessor. A very special processor that can handle mathematical computations at lightening speeds. The DSP that I'm involved with runs on a 40 mHz clock and Texas Instruments now has a version that runs at 50 mHz.

Like any new technology the price is always high at first. But when newer chips are developed, the old ones drop in price. That's true with the TexasInstruments TMS320C25 DSP. When it was first introduced about two years ago, it cost about $125.00. Now you can get them for about $25.00 in single quantities. That's why we choose the TI DSP for our project.

THE DSP25 BLOCK DIAGRAM/ DESCRIPTION

The DSP25 is an inexpensive Digital Signal Processor that plugs into the 8 bit expansion port of an IBM PC or IBM compatible computer. It provides audio connections to a receiver or transceiver for operating digital modes in the HF or VHF bands. It also has an 8 bit TTL input/output port for interfacing to a Packet or all mode TNC. There is also a 16 bit I/O port on a 32 pin header connector to interface to a baby board which can contain a dual parallel DAC for connecting an X/Y tuning scope or other ancillary devices.

The DSP can replace the TNC's analog filters, fsk demodulator or tone encoder. It can also be used as a digital audio filter for CW mode, a digital signal analyzer and a digital oscilloscope within the audio range. FSK signals are processed and converted to a TTL level to the 8 bit I/O port or they can be converted to an RS232 level and transferred to the audio out port. The FSK signal can also be regenerated (eliminating 100% of the noise) and interfaced to a TNC's audio input (A to A connection).

The audio to audio connection simplifies the "hook up" and still provides the advantage of improved error performance. The DSP25 consist of four basic circuits, the PC Host interface, a Texas Instruments 40 mHz TMS320C25 Digital Signal Processor chip, 8k words of RAM, and a Texas Instruments TLC32044C Analog Interface chip. It's constructed on an IBM PC/XT compatible 10" expansion PC board and the analog/digital connections are accessible on the rear bracket/panel.

THE HOST INTERFACE

The PC Host interface decodes the PC address, passes data from the 8 bit PC bus via the buffers and latches to the 16 bit DSP bus. It provides handshaking between the PC and DSP, and by placing the DSP chip in hold mode, DMA (direct memory access) from the 8k RAM to the PC I/O port is possible. There is also a sequential address decoder which allows the PC to access the ram in two 4k word pages for loading binary files from a floppy or hard drive and for providing direct memory access for large data transfers.

THE ANALOG INTERFACE

The Analog Interface chip converts the audio or linear signal to digital

data. It transmits the data on a receive serial communications port to the DSP chip. The DSP processes the data and returns it to the A/I chip via the transmit serial port. The A/I can be programmed for pass through mode and there are 3 gain steps available. The DSP pcb has filter chokes to reduce EMI interference to the receiver and a quad op-amp is used to boost the signal in either direction on the analog port.

SOFTWARE

The software for the DSP is still under development but we do have two working modems that are di-no-mite! The PKT modems are for packet and test results so far are very promising. We decided to work on the 300 baud modem first because the problems on H.F is causing the packeteers the most trouble. We have ran test using 45 baud RTTY and the PKT modem was very promising but the filters need to be retuned for the lower baud rate.

Here's a brief description

PKT SERIES MODEMS

The PKT series modem is computer software that is designed to operate on the PC compatible DSP25 Digital Signal Processor for 300 baud Packet Radio and ASCII modes. They where computer simulated and tested to obtain maximum noise rejection and the best possible error rate performance for Amateur and SWL applications.

Except for the analog interface and IO port, the block diagram on the next page is hypothetical and does not reflect an actual working circuit or electronic diagram. The modem filters and functional blocks are embedded in the software. Several functions can be changed or modified using the "Control Panel" software that is provided with each modem.

The Analog Input

The audio signal from an H.F. receiver/transceiver enters the analog interface chip and is converted to data. The data is sent to the DS Processor and it performs the mathematical functions (indicated by the blocks).

Pre-filtering

The first function is a sixth order Chebyshev bandpass filter. The filter reduces noise and improves the performance of the A.G.C.

block. The data is then processed by the limiter which sets a maximum numeric limit. The data is then passed to the second sixth order filter which further reduces noise and pre-filters the signal for the frequency detection blocks.

FSK Decoding (The Frequency Detection Block)

Two fourth order Bowtie tone filters are separately tuned at the mark and space frequencies. The filters separate the energy in FSK signal. The signal or data is then rectified by generating positive numbers from the mark filter and negative numbers from space filter.

Post filtering

The numbers are further processed using a lowpass filter. It removes the high frequency components in the serial bit stream and further improves the signal to noise performance. Other mathematical routines include a threshold detector and hysteresis. The data is then passed as a serial bit stream to the I/O port or other functions. The modem also includes a carrier detect, an FSK oscillator and control logic which allows the user to setup various parameters using the Control Panel software.

OTHER PKTA/PKTB MODEM FUNCTIONS

Modem Parameters

The Carrier detect routine keys the FSK oscillator on and off as well as providing an output via the I/O port on DIN1. It also (bydefault) sets the AI chip in a loopback mode when no signal is detected. This allows the user to monitor the channel via an external speaker/ amplifier during quiet channel conditions. The channel can also be monitored via the first and second prefilter which reduces the audio bandwidth and noise. The first and second perfilters can be used as a CW filter.

Audio to Audio connection

A parameter can be set which allows the user select the FSK oscillator only. This function provides an interface from the DSP to an external TNC's audio input and it regenerates the received signal with noise a free FSK generator. The TNC decodes the FSK using the improved signal to noise performance of the DSP. During a quite channel (no packets) the FSK oscillator will be disabled, then the

TNC can key the transmitter using the normal connection to the XMT key line for packet operation. If the monitor option was enabled and the regenerator disabled because no carrier was detected, the received channel can be monitored via the DSP using the full breakin capabilities of the software. The user can also use the audio oscillator to provide audio FSK to a transmitter,s "mike" input. Because of the XMTR's low input level, a resistor divider network is needed to drop the audio level to the XMT

Audio to Digital connection

The Audio input to the DSP connects to the receiver's speaker or aux audio output. It can handle levels as high as 1 volts p to p however, overdriving of the DSP can damage it or cause poor error performance. The typical level should be about .3 to .7 volts RMS.

The TNC's TTL level serial data input is connected to the DSP's DOUT0 output. The FSK is demodulated by the DSP and the serial bit stream is sent to DOUT0. The TNC decodes packets or RTTY using the improved signal to noise performance of the DSP. DOUT1 is the inverted serial output.

The TNC's TTL level serial data output is connected to the DSP's I/O port DIN0. During transmit, the data from the TNC is switched to the DSP's FSK oscillator.   The DSP,s oscillator is connected to the transmitter's audio input using an attenuater network. This allows the user to implement the DSP's continuous phase, frequency shift oscillator .

DOUT 2 is a TTL level Carrier detect. It can be connected to a TNC to be used as an external carrier detect.

DOUT3 is a XMT key line and can be connected to some TNC's for keying the transmitter. This output is a TTL level output and requires a special circuit for transmitter keying.

TEST RESULTS

I conducted a test using two PK232's and an Icom R71 common receiver on 20 meters (the TNC's where in monitor mode). One PK232 was connected to the DSP card Via the external modem input on the rear apron. A modem formerly called P3020 (now PKTB) was loaded into the DSP from an IBM PC. The other "barefoot" TNC was connected to a Compaq Deskpro and both computers copied the text to a capture

buffer. The time/date on both TNC's where set within a few seconds. A Radio Shack counter module #277-302 was connected to the carrier detect L.E.D. circuit. The threshold was adjusted for average strength packets.

HERE ARE MY RESULTS

Test #1

Both TNC's didn't copy very many packets. The band condition at that time was poor.

Test #2;

The band condition improved and 182 packets where counted. The PK232 copied 47 and the DSP/PK232 copied 116.

Test #3

Only 3 packets where copied on the barefoot PK232, on the other hand, the DSP copied 82 out of 202.

Test #4

There where 78 packets out of 487 for the PK232 and the DSP/PK232 copied 162.

As you can see the DSP, depending on the band conditions, did a much better job. The DSP makes a better FSK decoder because the filters where designed and simulated for a specific application (packet radio). If the circuit in the PK232 was simulated on a DSP the two units probably would have performed the same.

COPYING CW

The upgraded version of the PKT modems have a feature that allows the user to monitor the receivers audio through the FSK decoder's pre-filters. I used this setup to copy CW and weak cariers on 20 meters. I was able to pull out signals that where almost in-audible (about equal with the noise level). The second prefilter was selected. The first prefilter responce was about equal to a 4 pole BP chebychev. When I tuned to a stronger signal, I tuned across the filters bandpass (about 400 hz) in noticed as I reach the lower or upper limit of the passband, the signal dissapeared as if the filter had infinate stopband response.

Conclusion

The DSP is a newcomer in the HF digital world. More software and better modems that can handle the hostile HF environment are needed. Because the DSP is versitle modems can be developed, simulated and easly loaded. It will allow developers to try other modulation schemes that can greatly enhance digital communications on H.F.

Jack Albert Fellow Radio Buff
Tele (708) 512-7854
Tellabs, Inc. FAX (708) 852-7346
4951 Indiana Ave. jwa@tellabs.com
Lisle, IL
60532

Do you have a certain itch that's so private,
you'll only discuss it with your physician?

Date: Thu, 8 Apr 1993 01:55:18 GMT
From: usc!howland.reston.ans.net!usenet.ins.cwru.edu!news.csuohio.edu!sww@network.UCSD.EDU
Subject: ARRL living in the past?
To: info-hams@ucsd.edu

Perhaps the ARRL is too busy with emergency preparedness ... or the advancement of the radio art ... or the building of communications and technical skills ... or the establishment and maintenance of a pool of trained operators and technicians ... or of international goodwill.

Perhaps the controversial agendas of the lunatic fringe are not of interest.

Good for the ARRL. Stick it to them.

73,
Steve, NO8M

Date: 7 Apr 93 18:12:15 GMT
From: mvb.saic.com!unogate!news.service.uci.edu!usc!howland.reston.ans.net!gatech!
pitt!scraps!frankh@network.UCSD.EDU
Subject: Crystal Catalog
To: info-hams@ucsd.edu

In <y{$@byu.edu> richard@alaska.et.byu.edu (Richard B. Christensen) writes:

>Are there any crystal catalogs out there?

>Richard

Jan Crystals aren't too bad in pricing and the xtals seem to be ok too.
ADDRESS: 2341 Crystal Drive
         P.O. Box 06017
         Fort Myers, Fl. 33906-6017

Phone: 1-800-526-9825
       1-813-936-3750 (FAX)
       1-813-936-2397 (PLANT)

I hope this works for you!!! It works for me!

Frank

--

****
* Customer asked "What's that thing?".   *
* I answered chuckling "Well, it's a highly technical, sensitive   *

Date: 7 Apr 93 03:18:10 GMT
From: bobsbox.rent.com!s4mjs!spatula!ahm@rutgers.rutgers.edu
Subject: Install PL in TH21AT ?
To: info-hams@ucsd.edu

With many of the local repeaters using PL, I need to install a
a tone board in my Kenwood TH21AT handie, and there's not much
space inside this shirt-pocket-sized unit.

I'm looking at the Communications Specialists SS-32SMP.
Has anyone installed one of these?

Also, the tone board seems to be programmed by soldering jumpers.
Is there some way to use an external switch to make it easier to
reprogram it ?

Thanks,
Andy
--
Andreas Meyer, N2FYE ahm@spatula.rent.com Ne dit jamais jamais.

Date: 7 Apr 1993 22:22:38 GMT
From: sun-barr!west.West.Sun.COM!l1-a!flloyd@decwrl.dec.com
Subject: Need serial protocol for Uniden MR8100 scanner
To: info-hams@ucsd.edu

In article <1993Apr5.180949.25111@pixar.com> Bruce@Pixar.com (Bruce Perens)
writes:
>I bought a Uniden MR8100 at auction over the weekend.
>
>The scanner has a DB-9 connector for an "supervisory programming
>interface". This is supposed to plug into an IBM PC, and then you can
>program the channel memories, send a software command to unlock the
>cellular band, and program the alpha display designation for each of the
>channels.
>
>If anyone has investigated this scanner, please contact me. I'll be
>attempting to get a service manual and software from Uniden if I can.
>

I had the scanner, the programming cable, the Uniden software and
the Uniden Service manual. You can get the software, for $20 as
I recall, from one of those scanner specialty companies which advertise
in CQ and/or QST. Someone on the net here probably has a copy.

The software allows you to maintain a crude database on your PC
and UP/Download it to the MR-8100. With a special code word
(ECPA1988), the software will allow you to unput cellular frequencies.
The other major feature is that you can program alphanumeric
titles for the displayed frequencies.

I got rid of my 8100 because it does not do band scanning. It will
only scan what it has in memory - period. There is no way , for
example, to scan from 140-150 Mhz and stop on busy channels.

On the plus side, it seemed to have a fairly sensitive and quiet
receiver, and very strong audio. The service manual was nearly
useless with respect to the programming port. The best that you

will get is some schematics which show the pin layout of the CPU,
and some possible clues for hackers to investigate.

I tried to analyze the data protocol between the radio and the
PC, and found that there is some encryption taking place. I also
tried disassembling the PC software but it's written in compiled
BASIC and is very hard to make any sense of. I was not, for
example, able to find the secret code word in the software.

Anyway, have fun and 73,

-fred

--
[Fred Lloyd, AA7BQ   Fred.Lloyd@West.Sun.COM]
[Sun Microsystems,   Southwest Area Solaris Transition Manager]
[Phoenix, AZ   (602) 224-3517]

Date: 7 Apr 1993 21:58:00 GMT
From: mvb.saic.com!unogate!news.service.uci.edu!usc!howland.reston.ans.net!
noc.near.net!news.bbn.com!chowe@network.UCSD.EDU
Subject: Repeater coverage on MacKenzie Trail in British Columbia, Canada?
To: info-hams@ucsd.edu

Hi,

I have a friend here who is going to go hiking in a part of
British Columbia and is wondering what to carry with regard to
emergency communications equipment. He is willing to study for and
get a Technician license so he can carry a 2m handi, but that just
leads to the question of whether there will be any repeater coverage
should he run into trouble.

The area he'll be hiking is the Alexander MacKenzie Trail between
Quesnel and Bella Coola. This will take him through the Tweesmuit
Provincial Park, but much of the hiking will be outside, and there are
8000+ foot mountains around. I was wondering if any B.C. hams might
be familiar with this area and had any suggestions regarding possible
repeater (or any type of radio) coverage of the area for emergency
use. My guess is that there is little or none, but I'm not
familiar with the area, and I would be happy to be surprised.

Thanks in advance for any information you might provide,

Carl Howe
WG1V
chowe@bbn.com

Date: 7 Apr 93 21:03:34 GMT
From: pacbell.com!amdahl!amdahl!ikluft@network.UCSD.EDU
Subject: RFD: rec.radio.amateur reorganization [discussion summary 3/31]
To: info-hams@ucsd.edu

hbe@loretta.la.ca.us (Harris Boldt Edelman) writes:
>Ian Kluft, in <efB803hDceof00@amdahl.uts.amdahl.com>, states that there
>is support for the proposed reorganization of rec.radio.amateur, then
>presents a tally whose numbers show that a majority of those participating
>in the discussion did not favor the proposal. This is invidious.

When you take out the undecided or unclear (unclear == one-liners not
expressing any opinion) comments, it's 2-to-1 in favor of the split.
If you're counting the undecided posts, I had to include them only so no
one would say I was omitting anything. They obviously cannot be counted as
for or against.
--
Ian Kluft KD6EUI PP-ASEL   Amdahl Corporation, Open Systems Development
ikluft@uts.amdahl.com   Santa Clara, CA
[disclaimer: any opinions expressed are mine only... not those of my employer]

Date: 7 Apr 93 18:23:45 GMT
From: mvb.saic.com!unogate!news.service.uci.edu!usc!howland.reston.ans.net!gatech!
pitt!scraps!frankh@network.UCSD.EDU
Subject: Soldering Brass rod to SO-239? HELP?
To: info-hams@ucsd.edu

In <Pine.3.05.9303311336.A29570-a100000@engr.engr.uark.edu>
jfb2@engr.engr.uark.edu (Frank Buercklin) writes:

>I am constructing a 2m and 70cm ground plane for use with my HT and I am
>having problems getting the solder to stick to either the brass brazing
>rod that I'm using for all of the elements or the SO-239 connector that I
>am soldering the rod to. Does anyone have a clue as to how to make that
>solder stick to either of them? (The plans I am using call for solid wire
>solder and seperate flux) Do I need to use Acid flux instead of Rosin Flux?

Frank, if you clean the brass rod with fine grit sand paper and not touch
the area afterwards, the solder should stick. Depending on the brand of SO-239
you are using on how easy it is to get the solder to stick. Radio Shacks

connectors are a real pain to get solder to stick to, especially the outside holes for the ground plane elements. What I have found that does work most of the time is to grind some of the chrome off the connector around the holes. I do this with a 1/4" drill bit. Clean the inside of the center pin of the connector to get rid of the chrome in there too! Heat the rods, radiator and ground plane elements, about 1/4" to 1/2" from the connector and apply solder that has the flux in it, plus a little more rosin flux, to the rod at the point where the connection will be made. The center should be easy and the grounds will be a little harder, but IT WILL WORK.

73 de Frank Holden - KA3UWW

--

****
* Customer asked "What's that thing?". *
* I answered chuckling "Well, it's a highly technical, sensitive *

Date: Wed, 7 Apr 1993 20:39:59 GMT
From: usc!howland.reston.ans.net!agate!headwall.Stanford.EDU!nntp.Stanford.EDU!aquarius.Stanford.EDU!br.pct@network.UCSD.EDU
Subject: tnc or sync modems on Multi-Drop phone lines with ka9q ax25
To: info-hams@ucsd.edu

Hi,
  I am investigating to see if ka9q with attach (1)PI or (2)SCC AX25 can be used to drive a synchronous modems (up to 14.4k baud) network in a phone multidrop configuration, let the master drop be the router/gateway to Internet.

  AnyOne has any info about what sync modems or tnc's to use with csma/cd to do the job on a multi-drop phone line??? Or we have to write a token polling link layer software to ensure no collision???

  Thanks for any INFO!!!

Date: 7 Apr 93 17:10:58 GMT
From: usc!hacgate!dunes!tony@network.UCSD.EDU
To: info-hams@ucsd.edu

References <1993Apr5.211710.20894@nntpd2.cxo.dec.com>, <C548AC.4uA@hpqmoea.sqf.hp.com>, <gtaylor.123.734191246@taex003n.tamu.edu>
Subject : Re: Postal Expertise

That is why I use nothing but the arrl qsl bureau. one cost and I can ship hundreds of cards. After the first 100 dx, why go nuts? let the bureau send you the next new one..

Date: 7 Apr 93 23:25:37 GMT
From: rtech!amdahl!amdahl!ikluft@decwrl.dec.com
To: info-hams@ucsd.edu

References <C52vz5.4os@murdoch.acc.Virginia.EDU>,
<6e.Y03fHcfwf00@amdahl.uts.amdahl.com>, <C548Hq.6H6@murdoch.acc.Virginia.EDU>
Subject : Re: RFD: rec.radio.amateur reorganization

jeg7e@livia.acs.Virginia.EDU (Jon Gefaell) writes:
>Uhm, with all due respect, doesn't that mean 'Get your software fixed' ???

Yes, I'm just noting that he's saying "get your software fixed" to someone who probably can't do anything about it. Rather than antagonize the user, encourage them to send input to the author. That approach will probably yield better results.

I'm sure we'll hear more complaints from Waffle users. They need to realize that they don't have a firm foundation for their arguments. It really is time to push the author(s) to fix it to handle cross-posted articles like other news systems. It isn't in any RFC but the precedent has been strongly set by Unix's dominance of the Net - cross-posted articles should be stored only once in the spool, read only once by the user, and transmitted only once to neighbor sites.

One thing that may make more or less of a difference here is whether waffle sources are available or if it's only distributed in binary form. I personally don't need an answer to that - I have UTS (SVR4) on mainframes at work and Linux on my 386 box at home.
--
Ian Kluft KD6EUI PP-ASEL Amdahl Corporation, Open Systems Development
ikluft@uts.amdahl.com Santa Clara, CA
[disclaimer: any opinions expressed are mine only... not those of my employer]

End of Info-Hams Digest V93 #432
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